**Statistics Summative Assessment**

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| **NAME** |  | **CLASS** |  | **DATE** |  |

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| **You will be assessed on the following criteria:** | | |
| **Criterion A**: *Knowledge and Understanding (max 8)* | ***Your level:*** |  |
| **Criterion C**: *Communications in mathematics (max 6)* | ***Your level:*** |  |
| **Criterion D**: *Reflections in Mathematics (max 6)* | ***Your level:*** |  |

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| * **Assessment is to be completed over 3 blocks. All work is to be completed in class.** |

1. Calculate the *measure of central tendency* for Raw Scores.
2. range
3. mode
4. median
5. mean
6. Calculate the measure of spread for Raw Scores:

a. Calculate the inter-quartile range. \_\_\_\_\_\_\_\_\_\_\_

b. Are there outliers that may affect the mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. By defining the term *outlier*, explain your response for *b.*

1. Display Raw Score data in a box-and-whiskers plot.

a. Identify the five-point summary.

1. Construct a box-and-whisker plot.

IV. Measure and display of spread of raw scores

a. Calculate the:



* + - ση

1. List the raw scores that are within 1 standard deviation.
2. Reflect on the shape of distribution for this data.

V. Analyzing the data

There are 40 questions on this test.

a. Out of the ones answered correctly, which question is the mode?

b. Which is the mode of the questions answered *incorrect*?

* + - 1. Using the data from *b,* what conclusions could you make based on this information?
      2. What decision would you make based on your conclusion?
    1. What information does the row labelled “***this class***” tell you?
    2. What recommendations would you make for the class as a whole?
    3. What recommendations would you make for students B and P?

VI. This diagram shows the percentage scores for a Math and a Physics test for 40 students.

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| --- | --- | --- |
| Math test | Stem | Physics test |
|  | 2 | 5 9 |
| 9 9 | 3 | 6 8 9 |
| 8 3 2 0 | 4 | 5 6 7 |
| 9 9 6 4 3 | 5 | 1 2 3 3 3 5 8 9 9 |
| 8 7 7 3 1 | 6 | 0 0 1 2 2 4 5 5 6 8 |
| 9 6 5 4 3 1 0 | 7 | 3 4 5 6 |
| 8 5 3 2 2 1 1 1 0 | 8 | 0 1 1 1 2 8 |
| 9 8 5 4 4 3 2 2 1 | 9 | 3 5 6 |

1. Identify the median **and** for:



1. Math: \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_
2. Physics:\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_
3. Calculate the for each:



1. Math\_\_\_\_\_\_\_\_\_\_\_
2. Physics \_\_\_\_\_\_\_\_\_\_
3. How many scores are found within 2 standard deviations for each test?

1. Math \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain:

2. Physics\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain:

1. In relation to the **mode**, what type of distribution does this data have:
2. Math\_\_\_\_\_\_\_\_\_\_\_
3. Physics \_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TIPS!

* **Calculations:**

**You may use your calculator to find calculations of different measures. Be sure to show your work for all calculations!** State your answers beside your work, labelled and in a box.

* **Define all terms used.**
* **Be sure to use paragraph form and complete sentences when explaining math processes** and/or communicating mathematically.
* **Draw your graphs with appropriate scale and label.**

Your explanations and written responses should contain the following sections:

* **Clear and legible sentences.**
* **Graphs** showing any visuals necessary to illustrate or complement your explanations.
* **Explanation of calculations** if you have used a calculator (show work!)

**To obtain the highest level for the following criteria you will need to do the following.**

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| **Criteria** | **Level** | **Descriptors** | **Indicators** |
| ***Criterion A***  **KNOWLEDGE AND UNDERSATNDING** | **0** | * You have not reach a standard described by any of the descriptors given below. | * You have not reached a standard described by any of the descriptors given below. |
| **1-2** | * You have **attempted** to make **simple** deductions when solving problems in **familiar** contexts. | * You have **attempted** to collect and analyse data using measures of central tendency (mean, median, mode, and range) * You have **attempted** to calculate the inter-quartile range. |
| **3 - 4** | * + You have **sometimes** made **appropriate** deductions when solving **simple and more-complex** problems in **familiar** contexts. | * You have **sometimes** collected and analysis data using measures of central tendency (mean, median, mode, and range) and spread (inter-quartile range). * You have **sometimes** grouped, tabulated and graphed data to aid analysis (Box and whiskers) * You have **attempted** to calculate the standard deviation. |
| **5-6** | * You have **generally** made **appropriate** deductions when solving **challenging** problems in a **variety** of **familiar** context. | * You have **generally** collected and analysed data using measures of central tendency (mean, median, mode, and range) and spread (Inter-quartile range and standard deviation) with some guidance. * You have **generally** grouped, tabulated and graphed data to aid analysis with some guidance (Box and whiskers). * You have **generally** used measures of spread to analyse data in familiar situations only. (Identify values within 1 standard deviation) |
| **7-8** | * + You have **consistently** made **appropriate** deductions when solving **challenging** problems in a **variety** of contexts including **unfamiliar** situations. | * You have **consistently**:   Identify the median **and** , calculate the and  Identified data within 2 standard deviation from an **unfamiliar**  Situations. (back to back stem and leaf plot) |

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| **Criteria** | **Level** | **Descriptors** | **Indicators** |
| ***Criterion C***  **COMMUNICATION IN MATHEMATICS** | **0** | * You have not reach a standard described by any of the descriptors given below. | * You have not reached a standard described by any of the descriptors given below. |
| **1-2** | * You have shown **basic** use of mathematical language **and/or** forms of mathematical representation. The lines of reasoning are **difficult to follow.** | * You have shown **a few of the steps** in your calculations. * You have used only a **few mathematical terms** to explain your answer. * You **have not included** all of the following in your graph: neatly labelled axes and/or lines, appropriate scales, and five points of summary. * Your responses contain **improper** sentence structure and your interpretations were not clearly communicated. |
| **3-4** | * You have shown **sufficient** use of mathematical language **and** forms of mathematical representation. The lines of reasoning are **clear** though not always **logical** or **complete**. * You have demonstrated the ability to manipulate between different forms of representation **with some success**. | * You have **shown most** steps in your calculations clearly and neatly and have rounded to two decimals places when necessary. * You have used **mostly precise** mathematical language and notation to explain your answer. * You have **included most of the following** in your graph: neatly labelled axes and/or lines, appropriate scales, and five points of summary. |
| **5-6** | * You have shown **good** use of mathematical language **and** forms of mathematical representation. The lines of reasoning are **concise**, **logical** and **complete** * You have demonstrated the ability to manipulate **effectively** between different forms of representation. | * You have **shown all** steps in your calculations clearly and neatly and have rounded to two decimals places. * You have used **precise** mathematical language and notation to explain your answer. * You have **included all of the following** in your graph: neatly labelled axes and/or lines, appropriate scales, and five points of summary. * You have used **proper sentence structure** and could clearly communicate your suggestions. |

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| **Criteria** | **Level** | **Descriptors** | **Indicators** |
| **Criterion D**  **REFLECTION IN MATHEMATICS** | **0** | * You have not reached a standard described by any of the descriptors given below | * You have not reached a standard described by any of the descriptors given below. |
| **1-2** | * You have **attempted** to explain whether his or her results make sense in the context of the problem. You **attempt to describe** the importance of his or her findings in connection to real life. | * + You had **difficulty interpreting** meaningful conclusions from raw data scores.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of **limited** suggestions and recommendations for the entire class.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of **limited suggestions and recommendations** for 2 students. |
| **3-4** | * You have **correctly but briefly explained** whether your results make sense in the context of the problem and **described** the importance of his or her findings in connection to real life. * You have **attempted** to justify the   degree of accuracy of his or her results  where appropriate. | * + You were able to interpret **reasonably meaningful conclusions** from raw data scores.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of suggestions and recommendations for the entire class with **some guidance**.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of suggestions and recommendations for 2 students **independently***.* |
| **5-6** | * You have **critically explained** whether your results make sense in the context of the problem and provides a **detailed explanation** of the importance of his or her findings in connection to real life. * You have **justified** the degree of accuracy of your results where appropriate. You have **suggested improvements** to the method when necessary. | * + You were able to **interpret meaningfu**l conclusions from raw data scores.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of suggestions and recommendations for the entire class **without guidance**.   + You have used measures of spread to analyse data and explain the importance of your findings in terms of suggestions and recommendations for 2 students **independently**. |

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| **SELF-ASSESSMENT** | **A,C,D** | **STUDENT COMMENT:**    **Parents’ signature:** |

Statistics

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2009 – 2010 International Assessment of Mathematics



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| Questions |
|  |
|  |
| All 8th |
| This class |
| A |
| B |
| C |
| D |
| E |
| F |
| G |
| H |
| I |
| J |
| K |
| L |
| M |
| N |
| O |
| P |
| Q |

Key: a- absent (not included) m – missing answer (Value = 0) 0 – wrong 1 - correct